2003

NPS research: tied to defense needs now and in the future

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NPS RESEARCH: TIED TO DEFENSE NEEDS NOW AND IN THE FUTURE

"The war effort taught us the power of adequately supported research for our comfort, our security, our prosperity."
Vannevar Bush, 1970 on World War II

NPS faculty conducted over $50 million of research last year, most of it for the Navy and defense organizations. Our faculty and students are engaged in research in direct support of our operating forces. Two years ago, NPS created three Institutes as a means to provide a more tangible and immediate product to the customers that it supports, the Unified Combatant Commanders and the Fleet Commanders, those who deliver military effects.

Wayne E. Meyer Institute of Systems Engineering
Expeditionary Warfare Interdisciplinary Systems Engineering Student Project, Unmanned Aerial Vehicle Experimentation, Fleet and Joint Experimentation, Advanced Work in Naval Fires Network

Cebrowski Institute for Information Superiority and Innovation
Trusted Information Infrastructure For Force Superiority, Center for Study of Mobile Devices and Communications, Wireless Vulnerability Assessment

Modeling of Virtual Environments and Simulation (MOVES) Institute
3D Visual Simulation, Networked Virtual Environments, Computer-Generated Autonomy, Human-Computer Interaction, Technologies for Immersion, Defense and Entertainment Collaboration, Next-Generation Modeling

Enhancing Combat Capability

A Marine and a Navy student recently completed a thesis on the Integrated Theater Assessment Profiling System (iTAPS) which took the original stove-piped Theater Assessment Profiling System (TAPS) software solution and turned it into a robust, data-centric, web-based decision support system for Commander, Second Fleet. ITAPS uses the .Net Framework and ASP.NET/ADO.NET, along with SQL Server to provide a web-enabled application that gives an overarching, abstracted view of the battle space for the Operational Commander while still providing drill-down capability and trend analysis tools if more detail is desired. The software was developed using the extreme programming technique and black box testing methods. A demonstration was performed at Second Fleet to test its acceptability and usability.

Some time ago, ... we partnered with Microsoft and NPS to take our home-built Theater Assessment visual tool (TAPS) to the next generation. This resulted in two profound things, (1) we demonstrated the high order benefits of a direct partnership with NPS and private industry, and (2) we have a product that leverages the emerging .net technologies -- making our "picture" a product of numerous feeds and sources, regardless of the platform or system. Everyone is a winner in this sort of endeavor: private industry gleans insight into the inner workings and requirements of their biggest customer, the Post Graduate School curriculum connects directly with the evolving fleet issues, and we get something tangible and beneficial that we can put to use right away.
Commander of the Second Fleet, Admiral Cutler Dawson, USN

NPS faculty and students provided direct support to Millenium Challenge 02 for Joint Forces Command (JFCOM).

Students and faculty in the MOVES institute created the Army Games Project which has over 1 million registered users. Players, or potential recruits, are exposed to the life and culture of the Army in this game, thanks to the Army officer students who worked on the game.

MOVES has now been called upon to assess vulnerabilities with port security plans using agent-based simulation.

The NPS Mechanical Engineering Department developed signature reduction systems for current (preliminary design on the eductor/bliss used on CG-47, and DDG-51) and future (NPS created the concept for the advanced IR signature suppression for the Low Observable Multifunction Stack (LMS) Advanced Technology Demonstrator) warships.

I appreciate the outstanding technical and analytical support previously provided by Naval Postgraduate School (NPS) and the Naval Fires Network (NFN) team at the Meyer Institute (MI) of Systems Engineering…we're currently exploring additional joint fires network (JFN) limited objective experiments (LOE), which will be conducted over the next two years. Believe a continued C3F/NPS partnership in developing these LOEs will best meet requirements for fleet experimentation, data collection, analysis and strategy development. NPS-MI expertise participation during each LOE will prove invaluable in providing clear, concise metrics that can be utilized for future JFN initiatives.

- Commander, Third Fleet, VADM Michael Bucchi, USN

In the area of Homeland Security, NPS faculty and students are examining issues such as the use of unmanned vehicles to prevent spread of bio-chemical attacks, optimization of power grid design, and concealed weapon detection.

The Meteorology Department is called upon in many ways in support of fleet operations.

- NRO funded an effort to use classified remote sensing systems for military operations. Algorithms and techniques are quickly being transitioned for fleet use now.
- Working with Special Operations Command, NPS is developing tactical decision aids that will allow warriors to accurately assess the impact of surface atmospheric effects on the range of search radars.
- NPS faculty are preparing high resolution numerical forecasts of optical turbulence for the Air Force Airborne Laser Program.
- And another team, using a new approach for forecasting tropical cyclone movement, has reduced the forecast error and produced record forecast skill three years in row at the Joint Typhoon Forecast Center.

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